AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of detecting gas leaks, ~~the method~~ comprising ~~the steps of~~:

providing a gas filter correlation radiometer comprising a window in a housing, optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing, a beam splitter mounted in the housing as part of the optics for directing radiation entering the window from the target area to divide the radiation between the first optical path and the second optical path, the first optical path having a first ethane path length and the second optical path having a second ethane path length, the first ethane path length being different from the second ethane path length, and electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section, the detector section comprising a first detector on the first optical path and a second detector on the second optical path, and corresponding pixels on the first detector and second detector having collocated fields of view corresponding to a field of view of the gas filter correlation radiometer;

traversing a target area with [[a]] the gas filter correlation radiometer having [[a]] the gas filter correlation radiometer field of view oriented towards the target area, the gas filter correlation radiometer being tuned to detect ethane;

sampling the corresponding pixels of the first detector and the second detector simultaneously; and

identifying a gas leak upon the gas filter correlation radiometer detecting the presence of ethane by detecting variations in solar radiation reflected from the target area and received by the respective first detector and second detector.

2. (Original) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at 3000 cm^{-1}.

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3. (Previously presented) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth of 2850 to 3075 cm^{-1}.

4. (Original) The method of claim 1 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth up to 150 cm^{-1} above or below 3000 cm^{-1}.

5. (Canceled)

6. (Currently amended) The method of claim [[5]] 1 in which the ~~bi prism~~ beam splitter comprises a bi-prism formed of a pair of wedges, each wedge having a thinner side and a thicker side, the pair of wedges being joined along the respective thinner sides and oriented so that radiation on each of the first optical path and the second optical path passes through only a respective one of the wedges.

7–9. (Canceled)

10. (Original) The method of claim 6 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 3000 cm^{-1} by incorporating a filter in the optics that selects radiation in a passband that includes the ethane absorption peak at 3000 cm^{-1}.

11–14. (Canceled)

15. (Original) The method of claim 1 in which the gas filter correlation radiometer is mounted in an aircraft.

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16. (Previously presented) The method of claim 1 in which the gas leak is located along a pipeline, and detection of the gas leak is carried out only using detection of ethane.

17. (Original) The method of claim 1 in which the gas leak is detected as part of a reservoir mapping process.

18. (Currently amended) A gas filter correlation radiometer, comprising:

a window in a housing;

optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing;

a bi-prism beam splitter comprising a pair of side-by-side prisms mounted transversely in the housing in relation to the first optical path and the second optical path as part of the optics for directing radiation entering the window from an outside source along two divergent paths offset from each other by refraction through the bi-prism beam splitter to divide the radiation between the first optical path and the second optical path;

the first optical path having a first gas path length and the second optical path having a second gas path length, the first gas path length being different from the second gas path length; and

electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section.

19. (Canceled)

20. (Original) The gas filter correlation radiometer of claim 18 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 3000 cm^{-1}.

21. (Previously presented) A gas filter correlation radiometer, comprising:

a window in a housing;

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optics defining a first optical path and a second optical path between the window and a detector section mounted in the housing;

a beam splitter mounted in the housing as part of the optics for directing radiation entering the window from an outside source to divide the radiation between the first optical path and the second optical path;

the first optical path having a first gas path length and the second optical path having a second gas path length, the first gas path length being different from the second gas path length; and

electronics for processing signals produced by the detector section as a result of radiation being directed by the optics onto the detector section, the gas filter correlation radiometer being tuned to detect ethane using an ethane absorption peak at a bandwidth of at least 2850 to 3075 cm^{-1}.

22. (Previously presented) The gas filter correlation radiometer of claim 21 in which the gas filter correlation radiometer is tuned to detect ethane using an ethane absorption peak at a bandwidth up to 150 cm^{-1} above or below 3000 cm^{-1}.

23. (Previously presented) The gas filter correlation radiometer of claim 21 in which the gas filter correlation radiometer is tuned to detect ethane using the ethane absorption peak at 2850 to 3075 cm^{-1} by incorporating a filter in the optics that selects radiation in a passband that includes the ethane absorption peak at 2850 to 3075 cm^{-1}.

24. (Original) The gas filter correlation radiometer of claim 18 in which the first optical path incorporates a gas filter containing ethane.

25. (Original) The gas filter correlation radiometer of claim 24 in which the second gas path length is lower than the first gas path length.

26–31. (Canceled)

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32. (Not entered)

33. (New) The gas filter correlation radiometer of claim 18 in which each prism of the side-by-side prisms has a thinner side and a thicker side, the pair of side-by-side prisms being joined along the respective thinner sides.

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